

# PDM-IF

STEP PDM data exchange



## *Information Technology for Engineering & Manufacturing*

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*NIST, Gaithersburg, MD*

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NIST/PDES, Inc.



# PDM-IF Overview

- ▶ The PDM Implementor Forum
- ▶ PDM data exchange scenarios
- ▶ STEP PDM data exchange
- ▶ Testing and evaluation process
- ▶ Status of test campaigns
- ▶ Status of processors
- ▶ PDM-CAD integration scenarios
- ▶ Future directions

# PDM-IF Background

- *Where did it come from?*
  - The PDM-IF emerged as a testing and validation environment for the specification and implementation of the STEP PDM schema
  - The STEP PDM schema is jointly developed by PDES, Inc and ProSTEP; it is endorsed by J-STEP
- *Why do we need it?*
  - There were interoperability concerns regarding the STEP Application Protocols 203, 209, 210, 212, 214, and 232 in the area of product data management
  - We needed to establish a common schema for PDM vendors to implement and for STEP AP developers to use as a basic building block for core PDM functionality

# PDM-IF Background

- *What is the goal?*
  - Establish a core set of entities in STEP which support PDM
  - Test these core entities via roundtables, demos, and pilots
  - Harmonize the STEP core with OMG, CALS, MIL-STD2549, ...
  - Introduce STEP PDM core to Shipbuilding, Product Life Cycle Support (PLCS), and other STEP development projects
  - Factor the resulting entities and supporting structures back into existing STEP APs as core modules to enable interoperability
- *What is the role of NIST?*
  - Support development through AP harmonization and STEP modules
  - Support testing by development of test methods, testing procedures, and supporting tools and techniques
  - Facilitate testing through test data development, application of the testing process (procedures, tools, and techniques), and identification, interpretation, and resolution of issues

# PDM-IF The PDM Implementor Forum

## Combined ProSTEP / PDES, Inc. Activity

### Goal:

- Harmonize PDM implementations based on the STEP PDM Schema
- PDM Schema Usage Guide, Recommended Practices
- Test campaigns

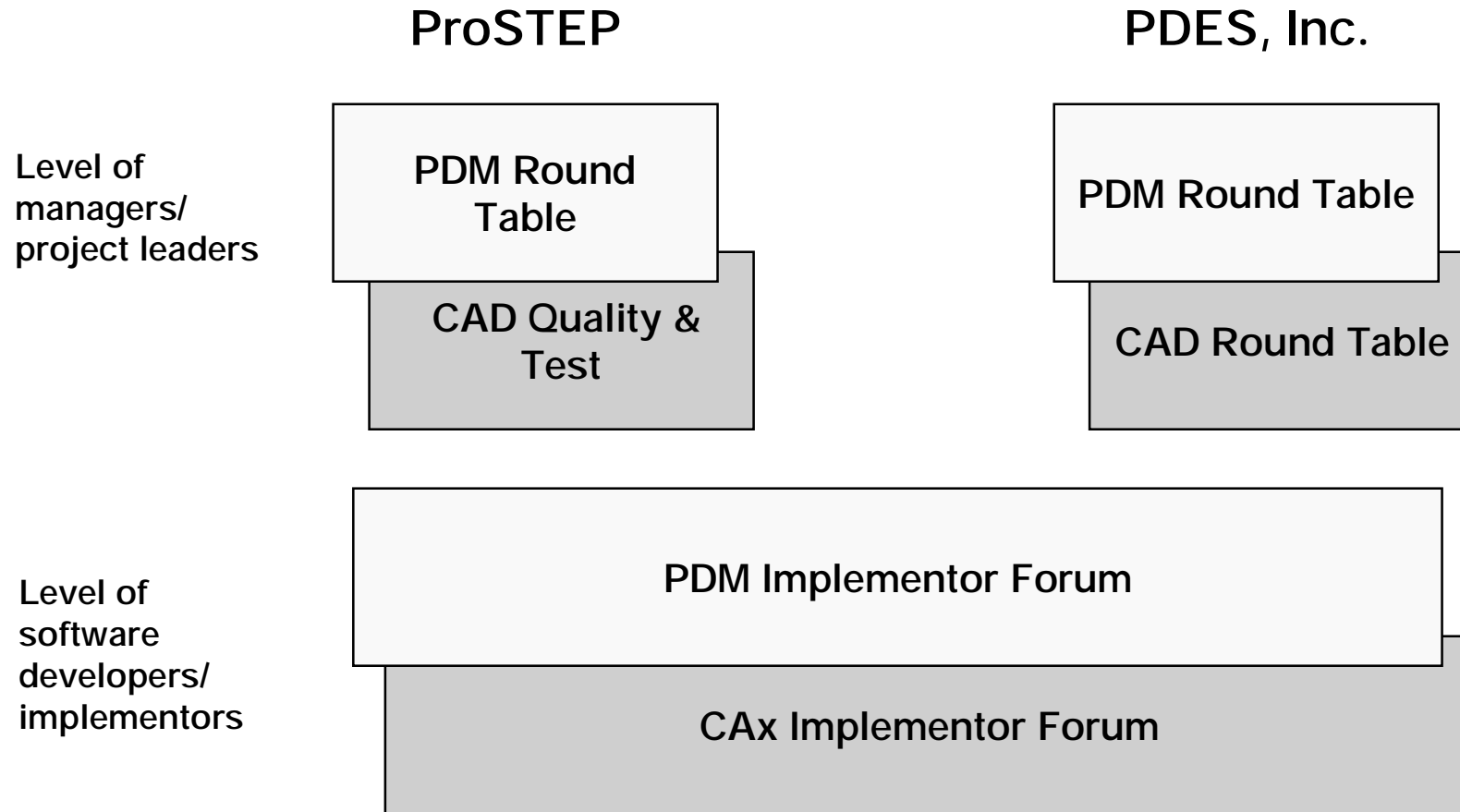


### Status:

- High interest of both PDM users and vendors
- PDM Schema Usage Guide for PDM Schema 1.1 publically available
- Two joint test campaigns have been performed in 1999, three planned in 2000

# PDM-IF

## Harmonized Workgroups at ProSTEP and PDES, Inc.



# PDM-IF PDM Implementor Forum Members

Implementor	System	Status
Bae Systems	ENOVIApm	Prototype
BMW	PRISMA	Prototype
Contact Software	CIMDatabase	Prototype
Daimler Chrysler/debis	GIS	Released
DASA M	Metaphase	Prototype
debis Systemhaus	CATIA	Prototype
Eigner & Partner	CADIM/EDB	Commercial
ENOVIA/Dassault Systemes/IBM	VPM	Prototype
ISS	InSync	Prototype
Matrix One	Matrix	Planned
Metaphase/SDRC	Metaphase	Commercial
NASA	NED	Prototype
ProSTEP	PDM Editor	Prototype
PTC	Windchill	Prototype
Raytheon	Sherpa	Prototype
SAP	R3 PLM	Prototype
UG Solutions	iMAN	Prototype
VW	KVS	Prototype

# PDM-IF Organizations Most Active in Realizing and Implementing STEP in Product Data Management



Alenia  
 Bae Systems  
 BMW  
 Bosch  
 CASA  
 Contact Software  
 Continental Teves  
 DaimlerChrysler  
 DASA M  
 debis Systemhaus  
 Delphi Automotive  
 Eigner+Partner  
 ENOVIA/Dassault Systemes/IBM  
 Opel  
 SAP  
 Seania  
 Siemens  
 Steyr-Daimler-Puch  
 Fahrzeugtechnik  
 Volvo  
 VW/Audi  
 Zahnradfabrik  
 Friedrichshafen

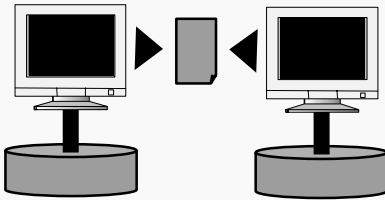


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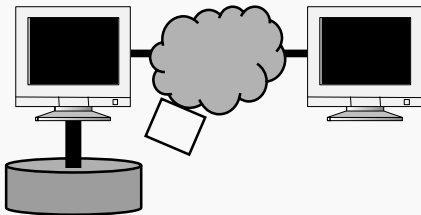
# PDM-IF

## Most Promising Approaches for Product Data Communication



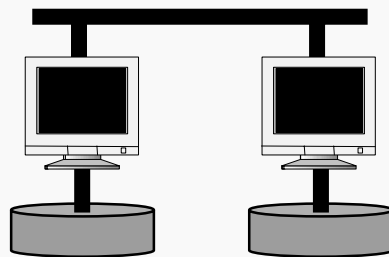
### PDM Data Exchange

- Asynchronous data exchange
- Technology and tools available
- Productive pilots ongoing
- Designed for supplier integration



### PDM Web Clients

- Viewing of data and use of selected functions via the network
- Technology available
- Only efficient for the supplier in conjunction with other solutions



### PDM Data Sharing

- Synchronous data communication
- Technology in pilot stage (i.e. PDM Enabler)
- Semantic problems not solved
- Good for future data integration especially within a company

# PDM-IF User Scenarios Supported by a PDM Backbone

**Organizational data of parts and products**  
(identification, versioning, authorization, properties etc.)

**Organizational data of documents and CAD models**  
(identification, versioning, authorization, properties etc.)

**Relationships between internal and customer's / supplier's view on parts and products, documents and CAD models**

**Product structure for bill-of-material and relationship to CAD assemblies**

**CAD assembly structures including transformations to support Digital Mock Up (DMU) processes**

**Work flow triggers and work management data**  
(information about work request, work order, project etc.)

# PDM-IF Overview



The PDM Implementor Forum



PDM data exchange scenarios



STEP PDM data exchange



Testing and evaluation process



Status of test campaigns



Status of processors

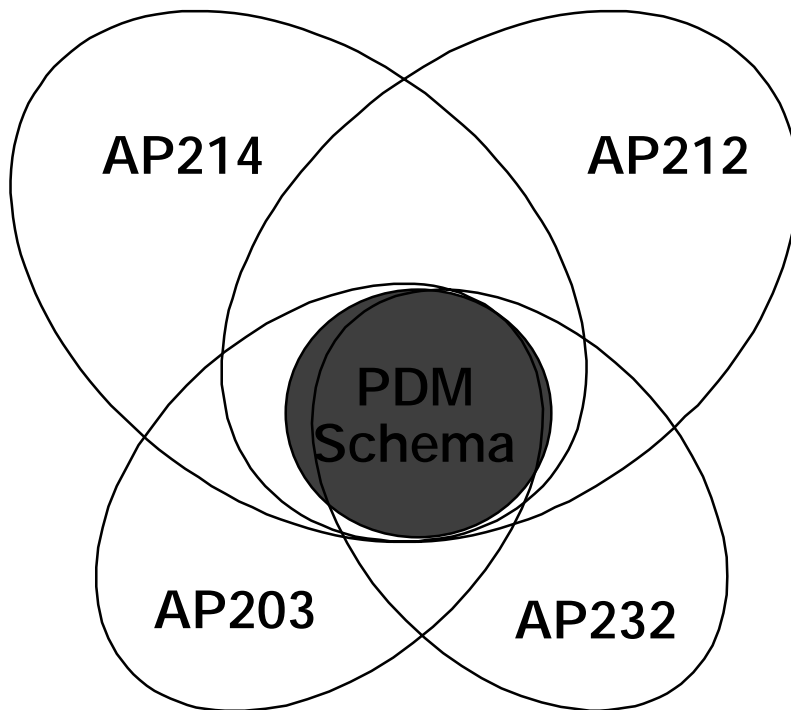


PDM-CAD integration scenarios



Future directions

# PDM-IF STEP PDM Schema

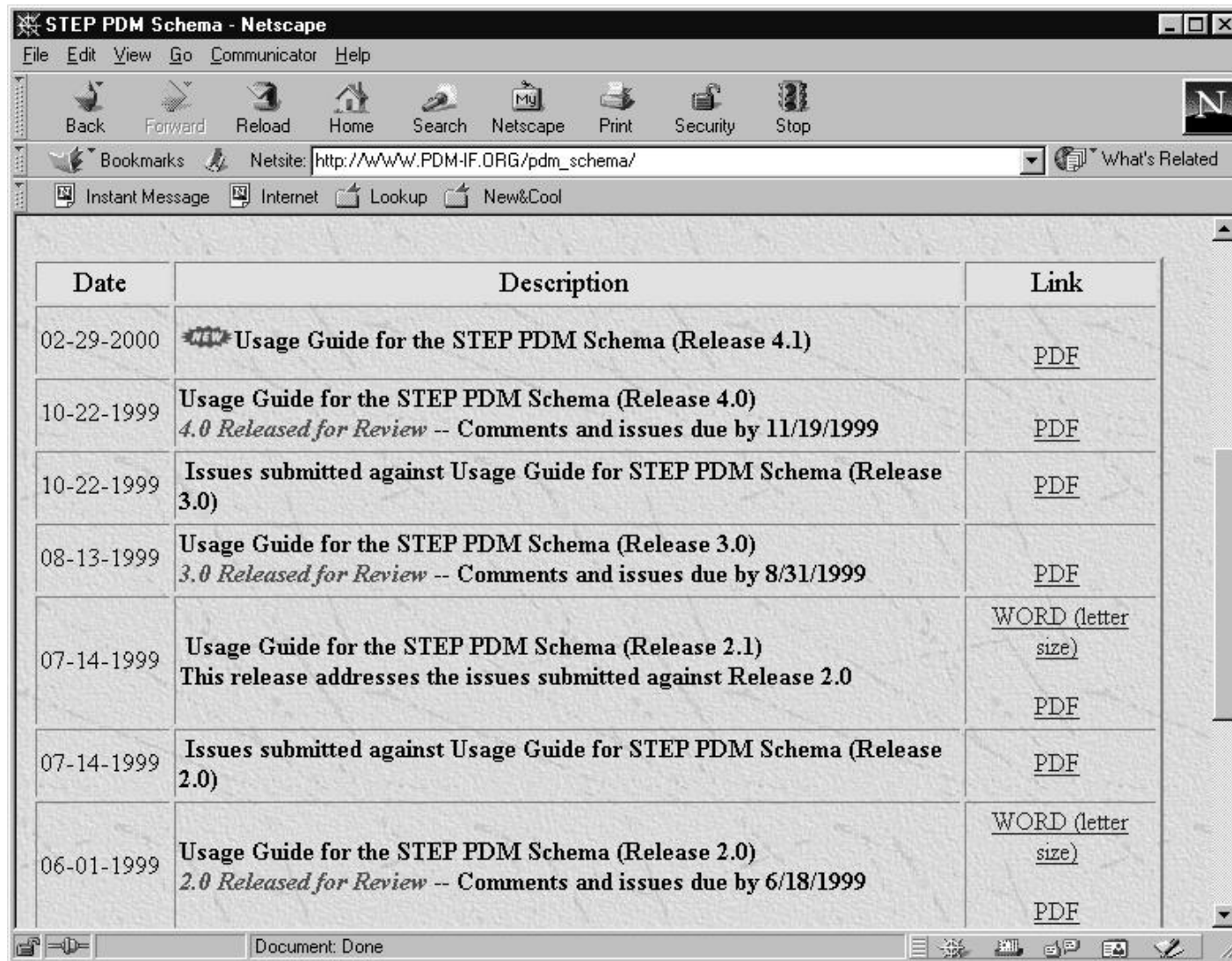


- ➡ Common PDM data schema generated and maintained by PDES, Inc., ProSTEP and JSTEP
- ➡ Real Subset of PDM relevant STEP APs (AP203, 212, 214, 232)
- ➡ Fulfills nearly all requirements for PDM data exchange

Main functionality for parts and documents:

- Identification
- Versioning
- Structures incl. transformations
- Approvals and authorization
- Project, work order, work request (not included in AP232)
- Effectivities and validity
- Classification and properties

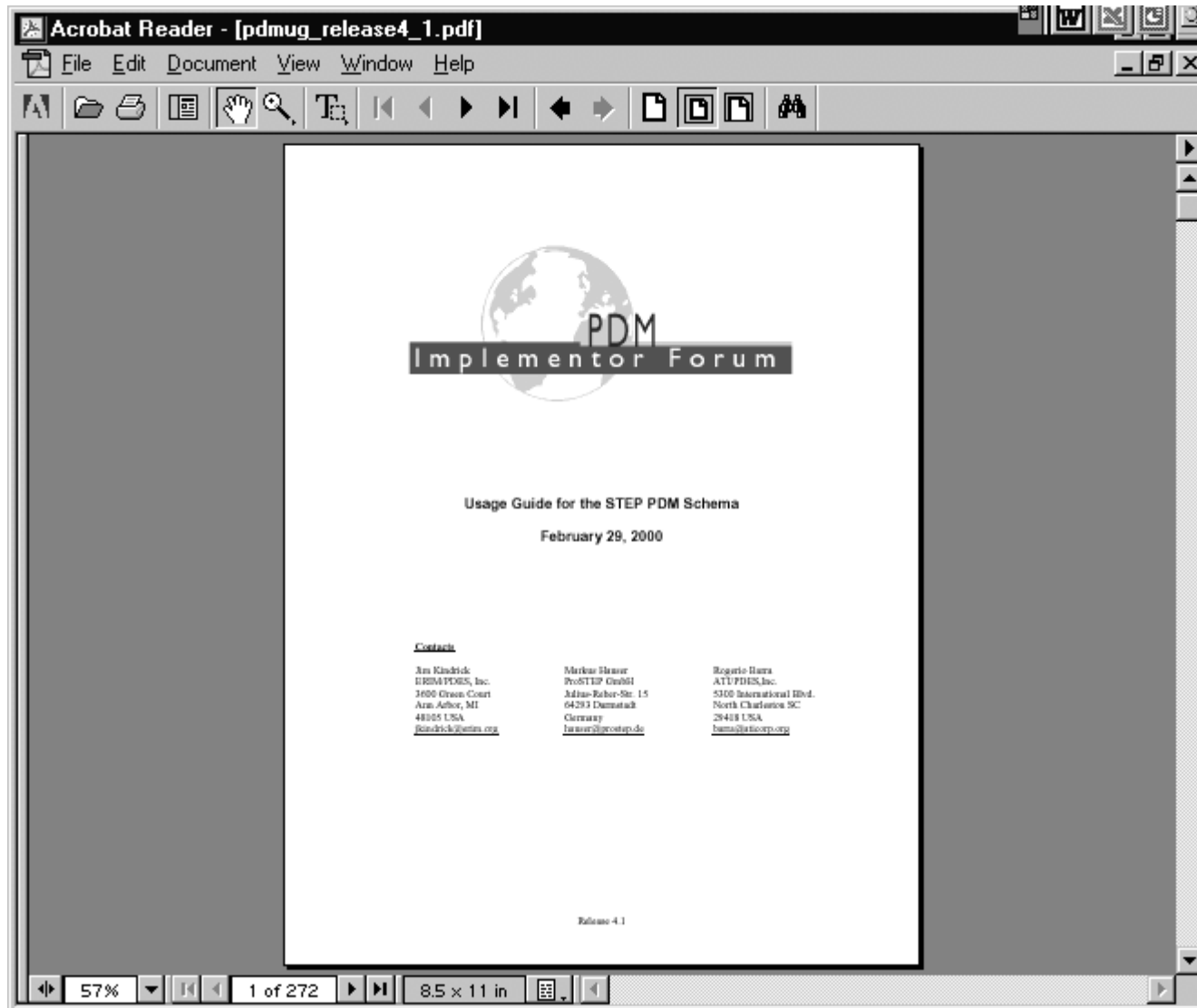
# PDM-IF PDM Usage Guide Release 4.1



Date	Description	Link
02-29-2000	<b>NEW</b> Usage Guide for the STEP PDM Schema (Release 4.1)	<a href="#">PDF</a>
10-22-1999	Usage Guide for the STEP PDM Schema (Release 4.0) <i>4.0 Released for Review -- Comments and issues due by 11/19/1999</i>	<a href="#">PDF</a>
10-22-1999	Issues submitted against Usage Guide for STEP PDM Schema (Release 3.0)	<a href="#">PDF</a>
08-13-1999	Usage Guide for the STEP PDM Schema (Release 3.0) <i>3.0 Released for Review -- Comments and issues due by 8/31/1999</i>	<a href="#">PDF</a>
07-14-1999	Usage Guide for the STEP PDM Schema (Release 2.1) This release addresses the issues submitted against Release 2.0	<a href="#">WORD (letter size)</a> <a href="#">PDF</a>
07-14-1999	Issues submitted against Usage Guide for STEP PDM Schema (Release 2.0)	<a href="#">PDF</a>
06-01-1999	Usage Guide for the STEP PDM Schema (Release 2.0) <i>2.0 Released for Review -- Comments and issues due by 6/18/1999</i>	<a href="#">WORD (letter size)</a> <a href="#">PDF</a>

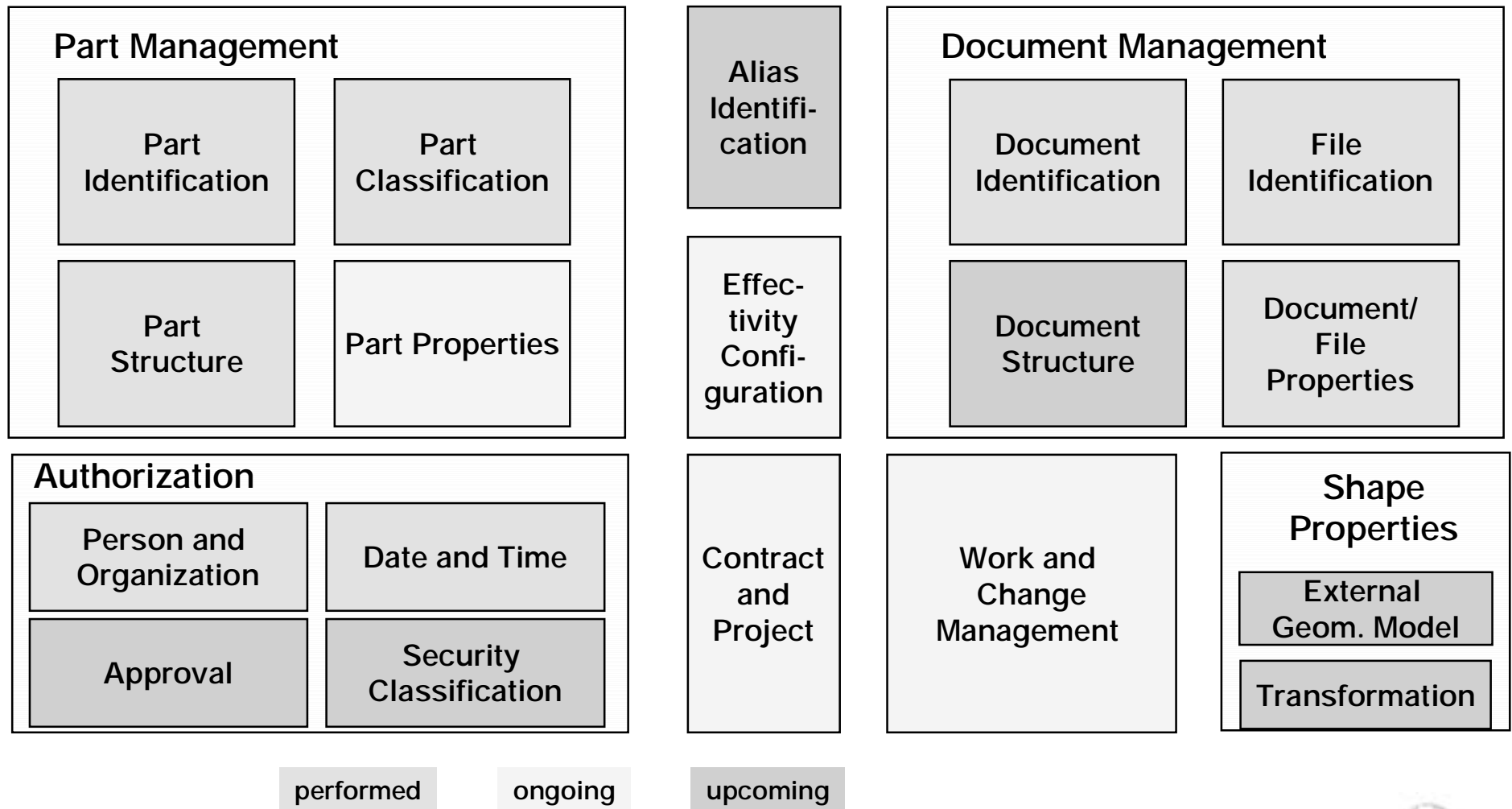
...available!

# PDM-IF PDM Usage Guide Release 4.1



# PDM-IF

## Scope of the STEP PDM Schema and Test Campaigns (Status: April 2000)



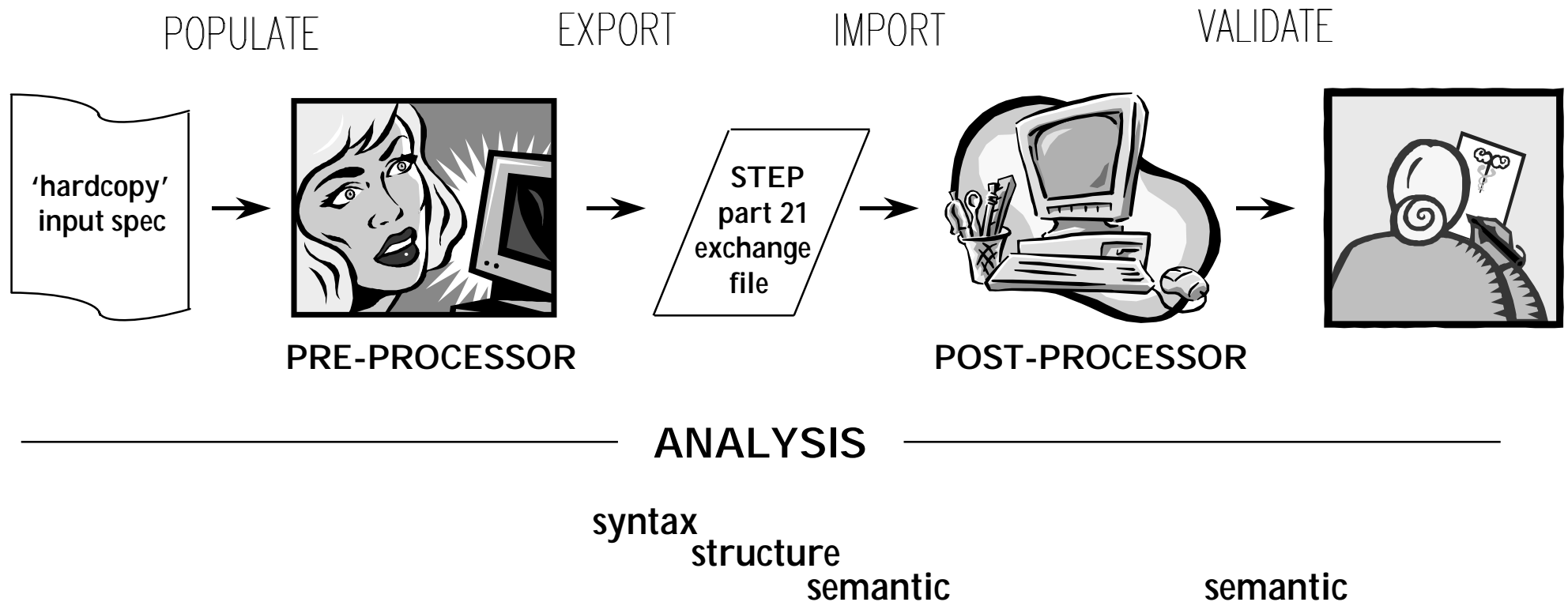


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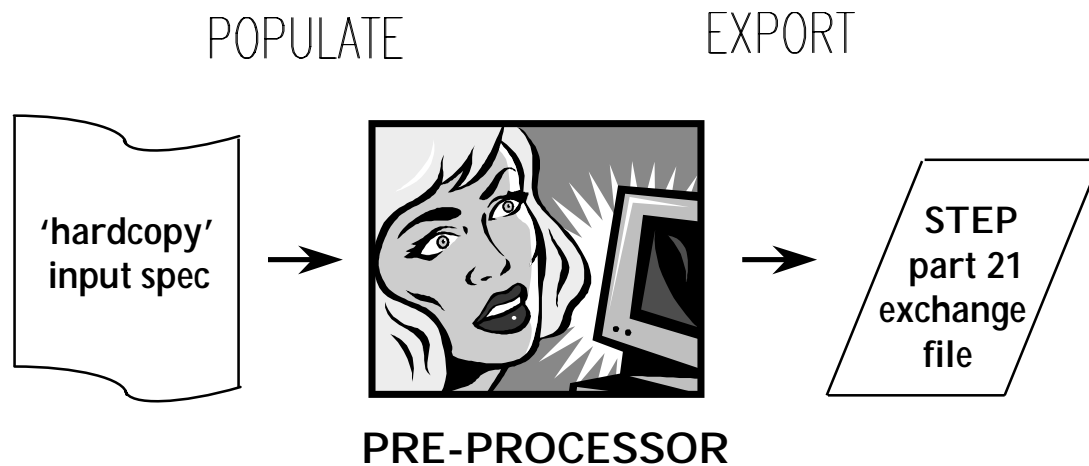
# PDM-IF Testing and Evaluation Process

INTEROPERABILITY TRANSACTION/EXCHANGE



# PDM-IF Conformance Evaluation Process

CONFORMANCE TRANSACTION/EXCHANGE: PRE-PROCESSING



---

ANALYSIS

---

syntax  
structure  
semantic

# PDM-IF Model Construction and Population

**PDM Implementor Forum Test Case**  
**ps2**  
**Explicit Assembly Bill Of Material**  
**Multiple Individual Component Occurrences**

This test case includes information from the Part Identification, Part Categorisation, Authori Structure Units of Functionality. An assembly part (part number 'h1', version 'A', named 'hub as identified and defined from the design viewpoint. This assembly is made up of three components,

Part List	Quantity
• h1(A) : hub assembly	
– d1(B) : disc with holes d1-1 : disc001	1
– ca1(B) : cap ca1-1 : cap001	1
– s1(A) : sleeve assembly s1-1 : sleeve001	1
• cy1(B) : cylinder cy1-1 : cylinder001	1
• g1(B) : gasket g1-1 : gasket001 g1-2 : gasket002	2

```
graph TD
    h1((h1)) --- d1((d1))
    h1 --- ca1((ca1))
    h1 --- s1((s1))
    s1 --- cy1((cy1))
    s1 --- g1_1((g1-1))
    s1 --- g1_2((g1-2))
```

# PDM-IF Model Construction and Population

Preprocessor Input Specification for ps2 - Netscape

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Bookmarks Netsite: [http://www.pdm-if.org/test\\_cases/R2/ps2/ps2.csv.html](http://www.pdm-if.org/test_cases/R2/ps2/ps2.csv.html)

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### Preprocessor Input Specification for ps2

Id	V	Application Elements	Value
@754		Part_master	#10
@755		Part_master.number	#10, 'h1'
@756		Part_master.name	#10, 'hub assembly'
@757		Part_master.version_identifier	#11, 'A'
@758		Part_master.view_identifier	#12, 'hv1'
@760		Part_master.view_context_type	#350, 'assembly definition'
@762		Part_master.view_life_cycle_stage	#4, 'design'
@764		Part_master.application_domain	#2, 'mechanical design'

Document Done

Postprocessor Input Specification for ps2 - Netscape

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Bookmarks Netsite: [http://www.pdm-if.org/test\\_cases/R2/ps2/ps21.html#link11](http://www.pdm-if.org/test_cases/R2/ps2/ps21.html#link11)

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```

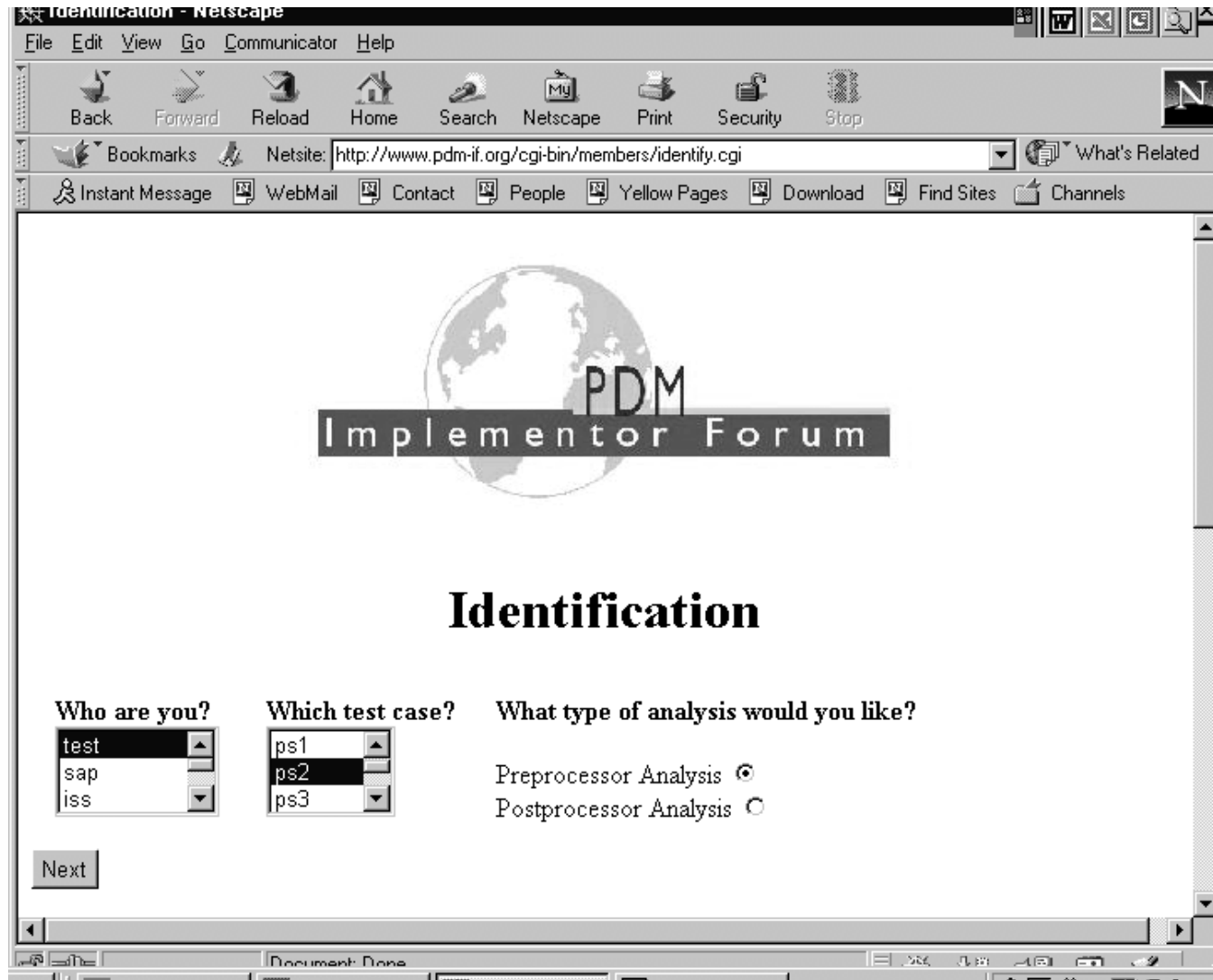
ISO-10303-21;
HEADER;
FILE_DESCRIPTION(('STEP pdmnet test data','PDM schema instantiation covering part_ident
FILE_NAME('ps2.p21','1999-04-05 T11:23:12','O. White','K. Black'),('New Ventures, Inc.
FILE_SCHEMA(('PDM_SCHEMA (1.1)'));
ENDSEC;
DATA;
/* primary application context and life cycle stage information */
#1=APPLICATION_PROTOCOL_DEFINITION('version 1.1', 'pdm_schema', 1999, #2);
#2=APPLICATION_CONTEXT('mechanical design');
#3=PRODUCT_CONTEXT('', #2, '');
#4=PRODUCT_DEFINITION_CONTEXT('part definition', #2, 'design');

/* optional characterization for assembly definition */
#340=PRODUCT_DEFINITION_CONTEXT_ROLE('part definition type', 4);
#350=PRODUCT_DEFINITION_CONTEXT('assembly definition', #2, '');
#520=PRODUCT_DEFINITION_CONTEXT_ASSOCIATION(#12, #350, #340);
#521=PRODUCT_DEFINITION_CONTEXT_ASSOCIATION(#42, #350, #340);

/* -- part master and context information for hub assembly -- */
#10=PRODUCT('h1', 'hub assembly', 4, (#3));
#11=PRODUCT_DEFINITION_FORMATION('A', 'description for version A of h1', #10);
#12=PRODUCT_DEFINITION('hv1', 'design view on hub assembly', #11, #4);
        
```

Document Done

# PDM-IF Test and Analysis System



The screenshot shows a Netscape browser window with the title "Identification - Netscape". The address bar displays the URL "http://www.pdm-if.org/cgi-bin/members/identify.cgi". The browser's toolbar includes buttons for Back, Forward, Reload, Home, Search, Netscape, Print, Security, and Stop. Below the toolbar, there are links for Bookmarks, Instant Message, WebMail, Contact, People, Yellow Pages, Download, Find Sites, and Channels. The main content area features a large globe graphic with the text "PDM Implementor Forum" overlaid. Below this, the word "Identification" is centered in a large, bold font. The form contains three sections: "Who are you?" with a dropdown menu showing "test", "sap", and "iss"; "Which test case?" with a dropdown menu showing "ps1", "ps2", and "ps3"; and "What type of analysis would you like?" with two radio buttons, "Preprocessor Analysis" (selected) and "Postprocessor Analysis". A "Next" button is located at the bottom left of the form area.

Identification - Netscape

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PDM Implementor Forum

## Identification

Who are you?

test  
sap  
iss

Which test case?

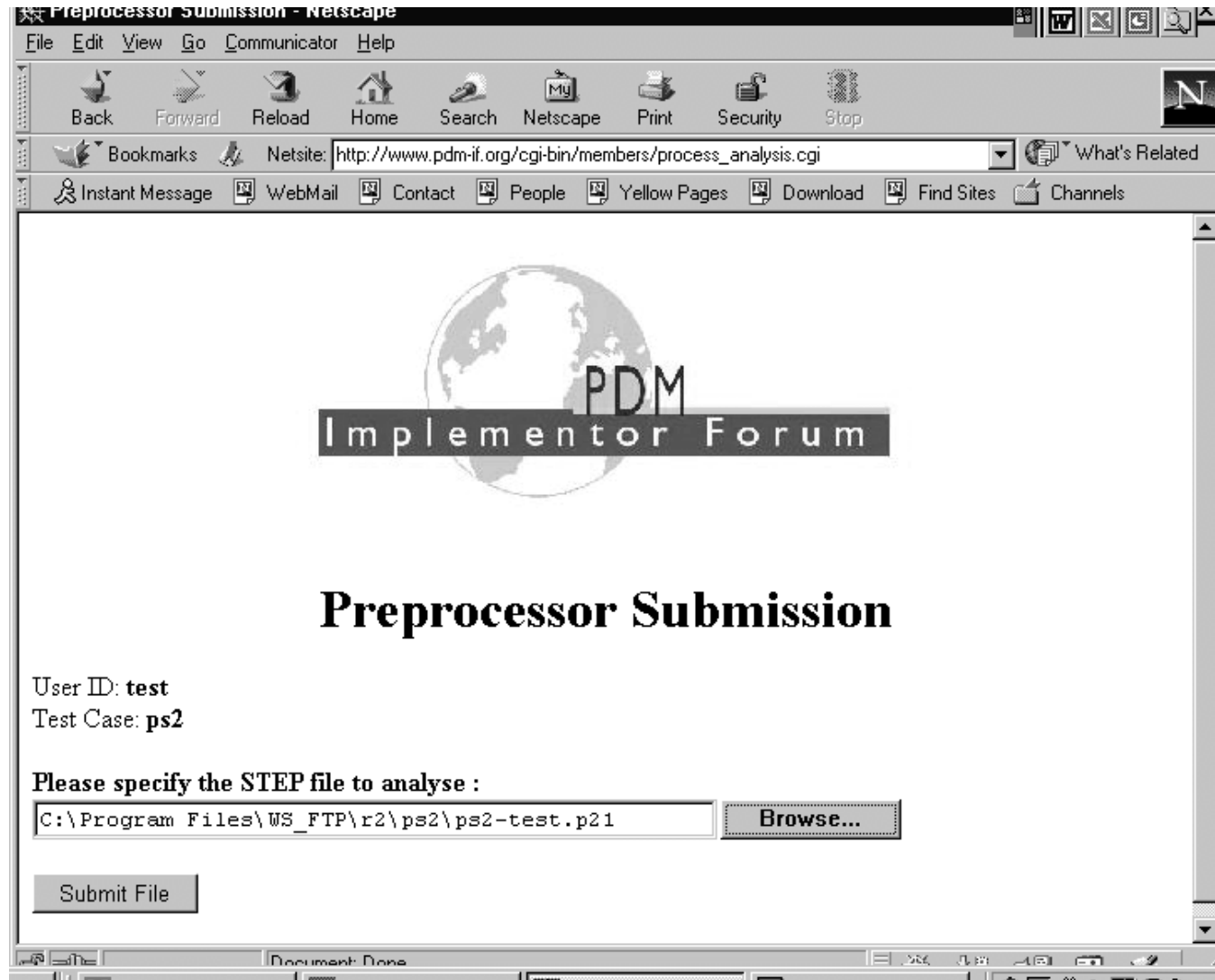
ps1  
ps2  
ps3

What type of analysis would you like?

Preprocessor Analysis ☒  
Postprocessor Analysis ☐

Next

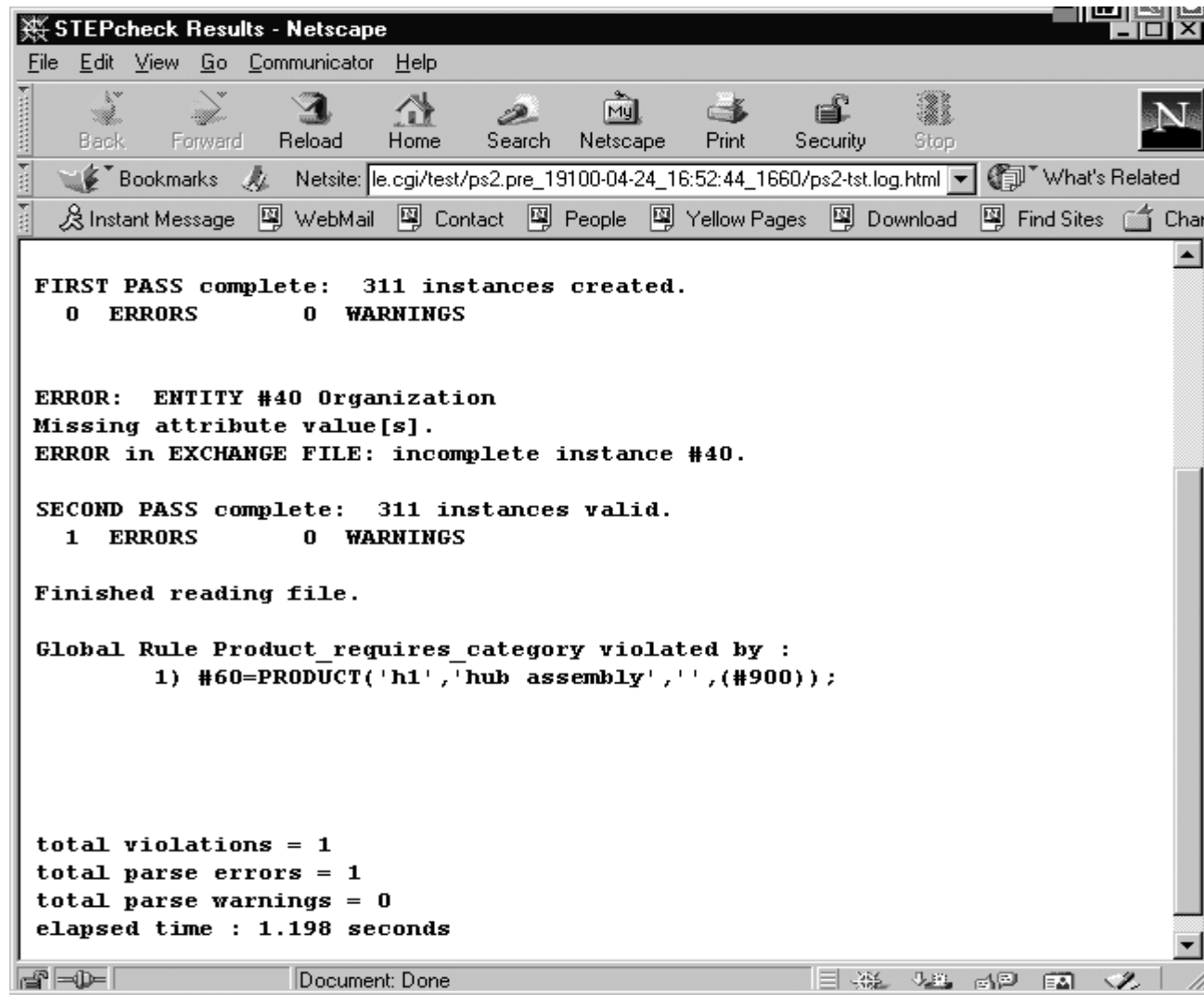
# PDM-IF Preprocessor Test and Analysis



The screenshot shows a Netscape browser window titled "Preprocessor Submission - Netscape". The address bar displays the URL "http://www.pdm-if.org/cgi-bin/members/process\_analysis.cgi". The browser's toolbar includes buttons for Back, Forward, Reload, Home, Search, Netscape, Print, Security, and Stop. Below the toolbar, there are links for Bookmarks, Instant Message, WebMail, Contact, People, Yellow Pages, Download, Find Sites, and Channels. The main content area features a large globe graphic with the text "PDM Implementor Forum" overlaid. Below this, the title "Preprocessor Submission" is displayed in a large, bold font. The form includes the following fields and buttons:

- User ID: test
- Test Case: ps2
- Please specify the STEP file to analyse :
- Text input field containing: C:\Program Files\WS\_FTP\r2\ps2\ps2-test.p21
- Browse... button
- Submit File button

# PDM-IF Export Syntax and Structure Analysis



```
STEPcheck Results - Netscape
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Bookmarks Netsite: le.cgi/test/ps2.pre_19100-04-24_16:52:44_1660/ps2-tst.log.html What's Related

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FIRST PASS complete: 311 instances created.
0 ERRORS 0 WARNINGS

ERROR: ENTITY #40 Organization
Missing attribute value[s].
ERROR in EXCHANGE FILE: incomplete instance #40.

SECOND PASS complete: 311 instances valid.
1 ERRORS 0 WARNINGS

Finished reading file.

Global Rule Product requires_category violated by :
1) #60=PRODUCT('h1','hub assembly','',(#900));

total violations = 1
total parse errors = 1
total parse warnings = 0
elapsed time : 1.198 seconds

Document: Done
```



# PDM-IF Export Semantic Value Analysis

**PDMnet Reference Results for ps2**

Id	V	Application Elements	Value	Req.	Match
@754		Part_master		M	754 70%
@755		Part_master number	'h1'	S	
@756		Part_master name	'hub assembly'	S	
@757		Part_master version identifier	'A'	S	
@758		Part_master view identifier	'hvl'	S	X
@759		Part_master view context type	'assembly definition'	S	X
@761		Part_master view life cycle stage	'design'	S	
@763		Part_master application domain	'mechanical design'	S	
@765		Part_master specific categories	'part', 'assembly'	S	X
@772		Organization to Part_master (has assigned organization)	@688	M	688
@778		Item_instance to Part_master (has as a component)	@579, @579.2, @579.3	M	579 579

**PDMnet Test Results for ps2**

Id	V	Application Elements	Value	Req.	Match
754		Part_master		M	754 70% 754 47%
755		Part_master number	'h1'	S	X
756		Part_master name	'hub assembly'	S	X
757		Part_master version identifier	'A'	S	
758		Part_master view identifier	'p1'	S	X >
760		Part_master view context type	'assembly definition', 'part definition'	S	X >
762		Part_master view life cycle stage	'design', 'design'	S	
764		Part_master application domain	'mechanical design', 'mechanical design'	S	
765		Part_master specific categories	'part'	S	X >
772		Organization to Part_master (has assigned organization)	@688	M	
777		Item_instance to Part_master (has as a component)	@579	M	

# PDM-IF Export Semantic Value Analysis

- GET UPDATED PDM-IF SCREENS!!!

PDMnet Reference Results for bom4

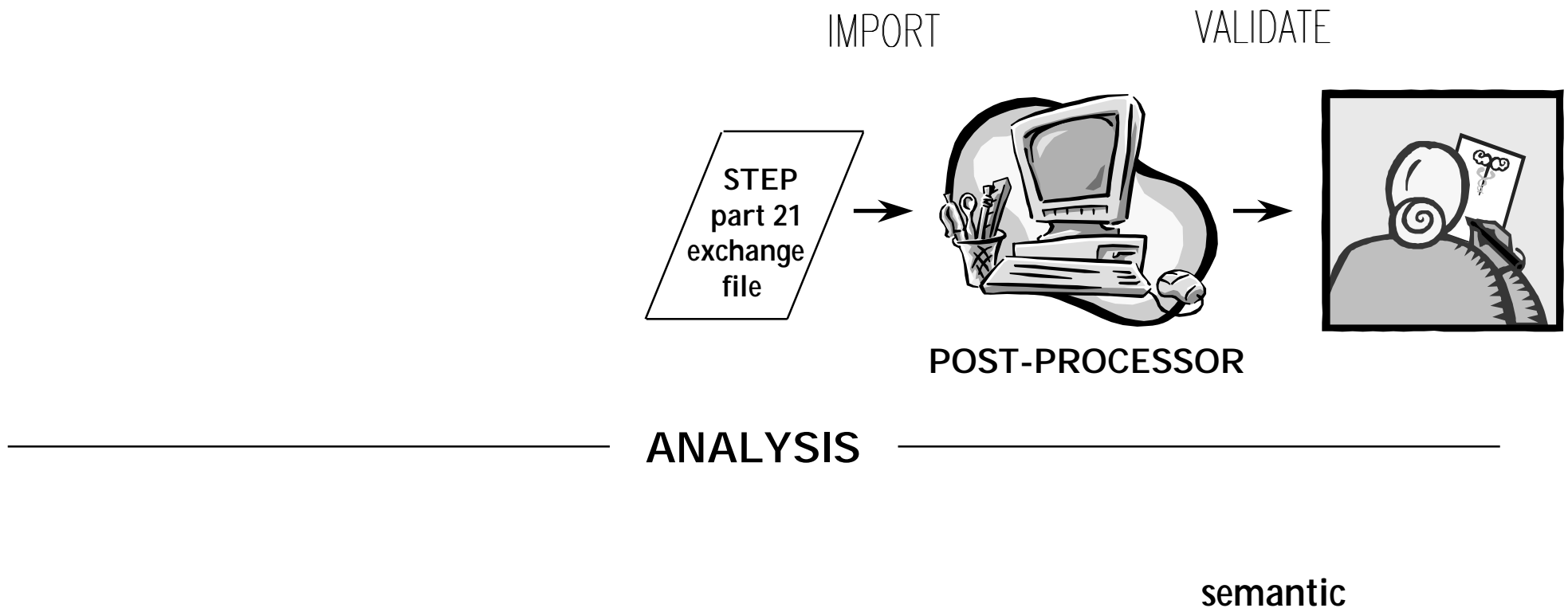
Id	V	Application Elements	Value	Req.	Match
@157	Approval			M	157 85%
@158	Approval date			S	
@159	Approval purpose		'Approved as initial STEP test case part'	S	X
@160	Approval status			S	
@171	Design_discipline_product_definition to Approval (approves)		<not_present>	M	
@174	Part_version to Approval (approves)		@1066	M	1066
@176	Supplied_part_version to Approval (approves)		<not_present>	M	
@157.2	Approval			M	157 71%
@158	Approval date			S	
@159	Approval purpose		'Not yet approved product configuration'	S	X
@160	Approval status			S	

PDMnet Test Results for bom4

@157.2	Approval			M	
@158	Approval date			S	
@159	Approval purpose		'Approved as initial STEP test'	S	
@160	Approval status			S	
@171	Design_discipline_product_definition to Approval (approves)		<not_present>	M	
@176	Supplied_part_version to Approval (approves)		<not_present>	M	
@157.3	Approval			M	157.6 85% 157.14 85%
@158	Approval date			S	
@159	Approval purpose		'Approved as test part design'	S	
@160	Approval status			S	
@171	Design_discipline_product_definition to Approval (approves)		<not_present>	M	
@174	Part_version to Approval (approves)		@1066.2	M	
@177	Supplied_part_version to Approval (approves)		@1918	M	

# PDM-IF Conformance Evaluation Process

CONFORMANCE TRANSACTION/EXCHANGE: POST-PROCESSING



# PDM-IF Test and Analysis System

The screenshot shows a Netscape browser window titled "Identification - Netscape". The address bar displays the URL "http://www.pdm-if.org/cgi-bin/members/identify.cgi". The browser's toolbar includes buttons for Back, Forward, Reload, Home, Search, Netscape, Print, Security, and Stop. Below the toolbar, there are links for Bookmarks, Instant Message, WebMail, Contact, People, Yellow Pages, Download, Find Sites, and Channels. The main content area features a large globe graphic with the text "PDM Implementor Forum" overlaid. Below this, the word "Identification" is centered in a large, bold font. The form consists of three sections: "Who are you?" with a dropdown menu showing "test", "sap", and "iss"; "Which test case?" with a dropdown menu showing "ps1", "ps2", and "ps3"; and "What type of analysis would you like?" with two radio buttons, "Preprocessor Analysis" (unselected) and "Postprocessor Analysis" (selected). A "Next" button is located below the first two sections. The status bar at the bottom of the browser window shows "Document: Done".

Identification - Netscape

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PDM  
Implementor Forum

## Identification

Who are you?

test  
sap  
iss

Which test case?

ps1  
ps2  
ps3

What type of analysis would you like?

Preprocessor Analysis ☐  
Postprocessor Analysis ☒

Next

Document: Done

# PDM-IF Postprocessor Test and Analysis

Postprocessor Analysis Form for ps2 - Netscape

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## Postprocessor Analysis Form for ps2

Id	V	Application Elements	Value	Req.
@754		Part_master		M
@755		Part_master.number	12345	S
@756		Part_master.name	'hub assembly'	S
@757		Part_master.version_identifier		S
@758		Part_master.view_identifier	'hv1'	S
@760		Part_master.view_context_type	'assembly definition'	S
@762		Part_master.view_life_cycle_stage	'design'	S
@764		Part_master.application_domain	'mechanical design'	S
@765		Part_master.specific_categories	('part', 'assembly')	S
@772		Organization to Part_master (has assigned organization)	@688	M
@778		Item_instance to Part_master (has as a component)	@579,@579.2,@579.3	M
@754.2		Part_master		M

Document: Done

# PDM-IF Import Semantic Value Analysis

PDMnet Reference Results for ps2 - Netscape

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Bookmarks Netscape [http://cpb.in/semtest/getfile.cgi/test/ps2.post\_19100-04-24\_17:16:47\_1734/reference.ecsv.html] What's Related

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## PDMnet Reference Results for ps2

Id	V	Application Elements	Value	Req.	Match
@754		Part_master		M	754 90%
@755		Part_master number	'h1'	S	X
@756		Part_master name	'hub assembly'	S	
@757		Part_master version identifier	'A'	S	
@758		Part_master view identifier	'hv1'	S	
@759		Part_master view context type	'assembly definition'	S	
@761		Part_master view life cycle stage	'design'	S	
@763		Part_master application domain	'mechanical design'	S	
@765		Part_master specific categories	'part', 'assembly'	S	
@772		Organization to Part_master (has assigned organization)	@688	M	688
@778		Item_instance to Part_master (has as a component)	8579, 8579.2, 8579.3	M	579 579.2

Document Done

PDMnet Test Results for ps2 - Netscape

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Bookmarks Netscape [http://cpb.in/semtest/getfile.cgi/test/ps2.post\_19100-04-24\_17:16:47\_1734/test.ecsv.html#754] What's Related

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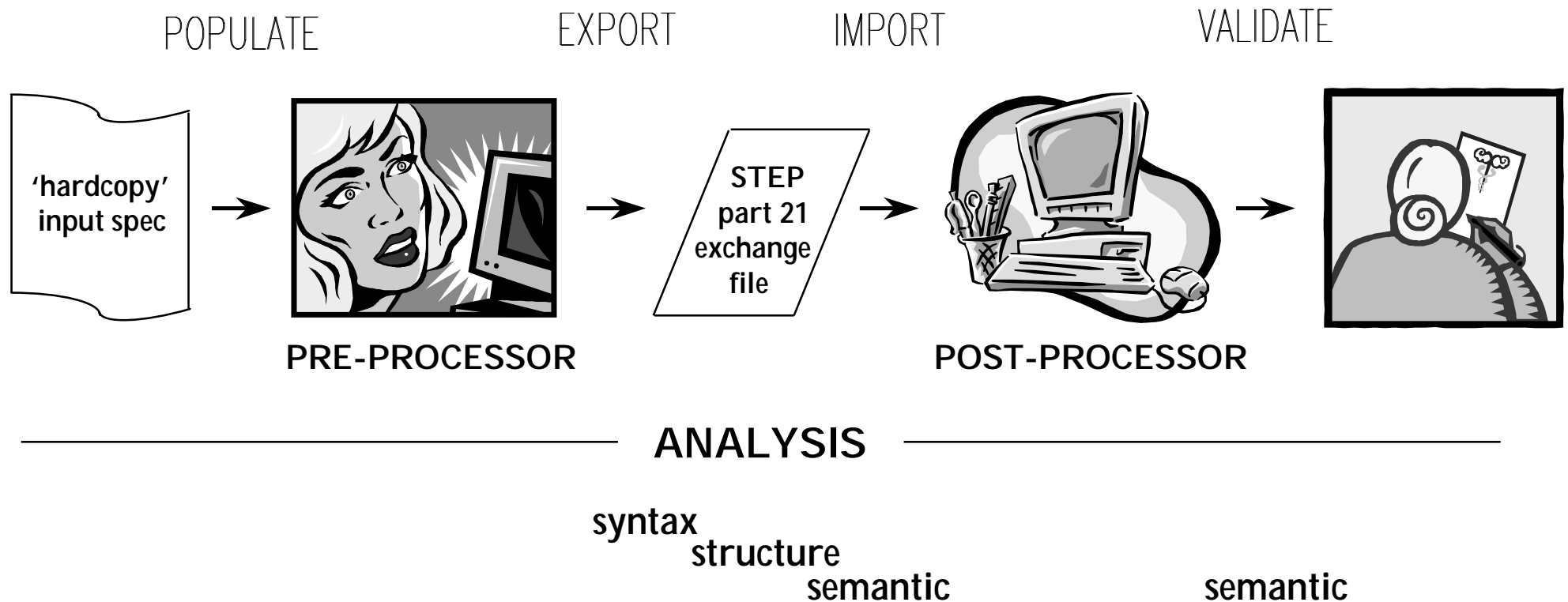
## PDMnet Test Results for ps2

Id	V	Application Elements	Value	Req.	Match
@754		Part_master		M	754 90%
@755		Part_master number	'12345'	S	X
@756		Part_master name	'hub assembly'	S	
@757		Part_master version identifier	'A'	S	
@758		Part_master view identifier	'hv1'	S	
@759		Part_master view context type	'assembly definition'	S	
@761		Part_master view life cycle stage	'design'	S	
@763		Part_master application domain	'mechanical design'	S	
@765		Part_master specific categories	'part', 'assembly'	S	
@772		Organization to Part_master (has assigned organization)	@688	M	
@778		Item_instance to Part_master (has as a component)	8579, 8579.2, 8579.3	M	

Document Done

# PDM-IF Interoperability Evaluation Process

INTEROPERABILITY TRANSACTION/EXCHANGE



# PDM-IF Overview

- ▶ The PDM Implementor Forum
- ▶ PDM data exchange scenarios
- ▶ STEP PDM data exchange
- ▶ Testing and evaluation process
- ▶ Status of test campaigns
- ▶ Status of processors
- ▶ PDM-CAD integration scenarios
- ▶ Future directions



# PDM-IF Round 3C Activity

## Activity by participant (totals across all test cases)

participant counts	pre-processing export			import post-processing								import of file exports		import by participant	
Participant	syntax	structure	exports	bw	ds	db	ep	is	ps	pe	vw	total	percentage	total	percentage
bw - BMW	7	10	1			1		1	1			3	37.5		
ds - Dassault	0	9	2			1	1	2	1			5	31.3	2	9.1
db - Debis	0	2	3				1	3	1			5	20.8	6	27.3
ep - Eigner & Partner	0	5	4			1		4	2			7	21.9	6	27.3
is - ISS														21	95.5
ps - ProSTEP	3	2	5			2	2	5				9	22.5	7	31.8
pe - PTC	1	1	1			1		1	1			3	37.5	1	4.5
vw - Volkswagen	1	4	1												
synthetic test case	0	0	5		2		2	3	1	1		11	27.5	#N/A	#N/A
total	12	33	22		2	6	6	21	7	1		43	24.4	43	24.4
percentage	#N/A		48.9		9.1	27.3	27.3	95.5	31.8	4.5		43	28.4	43	32.6



















## Activity by test case (totals across all participants)

test case counts	pre-processing export			import post-processing							import		
Test Case	syntax	structure	values	bw	ds	db	ep	is	ps	pe	vw	total	percentage
dp1	8				1	5		7	5	1		19	29.7
cfg1	4				1		3	4				8	25.0
pc1	3						2	3				5	20.8
eff1	3							3				3	12.5
wm1	4					1	1	4	2			8	25.0
total	22				2	6	6	21	7	1		43	24.4
percentage	55.0				9.1	27.3	27.3	95.5	31.8	4.5		43	22.6

# PDM-IF Round 3C Issues




- Several preprocessors did not export some/all prescribed constructs
  - *No effectivity at all - only product structure exported*
  - *configuration identification*
  - *contract*
  - *work request, work order*
- Value comparison analyzer doesn't penalize for missing constructs
  - *lower score for mismatched attributes than for entirely missing objects*
- Document properties (Several preprocessors exported file properties)
  - *document source property not prescribed but exported for files*
- Part view definition attributes typically not supported by participants
  - *id, description*




# PDM-IF Summary of Results of PDM-IF Test Campaigns

System \ Functionality	Product identification	Date and time	Person and organization	Document identification	Document assignment
BMW PRISMA	 				
Dassault Systems ENOVIAvpm	 				
DaimlerChrysler/debis GIS	 				
Eigner+Partner CADIM/EDB	 				
ISS In/Sync	 				
ProSTEP PDM Editor	 				
PTC WindChill	 				
SAP R3	 				
Unigraphics Solutions iMAN	 				

EXAMPLE

**Key:**

**Support (Export)**  high (81-100%)  medium (51-80%)  low (0-50%) — no

**Interoperability**  high (81-100%)  medium (51-80%)  low (0-50%) — not tested

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# PDM-IF

## Members of the Joint PDES/ProSTEP PDM Implementor Forum (Status: April 2000)

Company	System	Status	Company	System	Status
BMW	Prisma	In pilots used	NASA	NED	Prototype
Contact Software	CIM Database	Prototype tested	PTC	Windchill	Prototype tested
Daimler Chrysler	GIS	Released	Raytheon	Sherpa	Protytpe tested
Debis Systemhaus	CATIA	Prototype	SAP	R3 PLM	Prototype tested
Eigner + Partner	CADIM /EDB	Commercially available	SDRC / Metaphase	Metaphase	Commercially available
Enovia/ Dassault/IBM	ENOVIAvpm	Prototype tested	Unigraphics Solutions	IMAN	Prototype tested
Eurofighter	Metaphase Enovia/pm	In pilots used	VW	KVS	In pilots used
ISS	Insync	In pilots used	ProSTEP	PDM Editor*	In pilots used
Matrix One	Matrix	Planned			



Commercial PDM Systems

\* PDM STEP file viewer/editor

# PDM-IF Implementation of STEP PDM Schema 1.1

(Status: April 2000)

Functional Sections		Test Campaigns			Nov. '00
	Sept. '99	Dec. '99	March '00	July '00	
Part Identification					
Part Classification					
Part Properties		S			
Part Structure and Relationships					
Shape Properties					
Document Identification					
Document Classification					?
Document Properties					
Document Structure and Relationships					
External Files					
Document and File Association to Product Data					
Alias Identification					
Authorization					
Configuration and Effectivity Information			S		
Engineering Change and Work Management					

S = initial

= most constructs

completing

? = not decided



# PDM-IF Overview



The PDM Implementor Forum



PDM data exchange scenarios



STEP PDM data exchange



Testing and evaluation process



Status of test campaigns



Status of processors



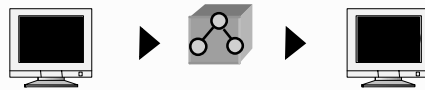
PDM-CAD integration scenarios



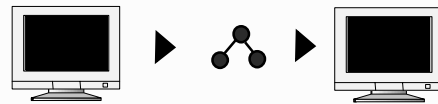
Future directions

# PDM-IF Key Scenarios for the Exchange of Product Geometry and Structures

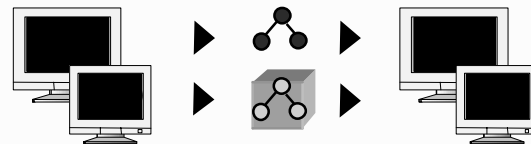
## 1. CAD -> CAD



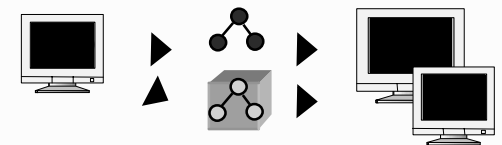
## 2. PDM -> PDM



## 3. PDM/CAD -> PDM/CAD



## 4. CAD -> PDM/CAD

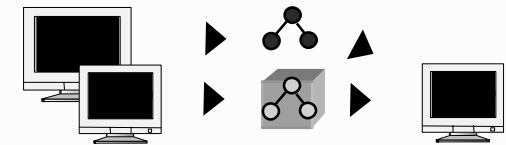


- main structure visible in the PDM system
- geometry relevant sub-structure visible in the CAD system

### 4.a Special case: no „PDM file“

- interactive input of meta data of „document“ in PDM system
- structures only visible in CAD system (without splitting)

## 5. PDM/CAD -> CAD



- main structure will be lost in CAD system
- geometry relevant structure visible in the CAD system

### 5.a Special case: no „CAD file“

- only a template including meta data for CAD
- usually no structures



Geometry file(s)



CAD relevant structures



PDM relevant structures and document meta data  
optional including CAD structure



# PDM-IF Major CAx / PDM Integration Scenarios

Case	Sender	Receiver	Scenario	Possible Bottlenecks
3	CAD/PDM	CAD/PDM	Packages of PDM and CAD files are exchanged	Agreement on details of structuring
4	CAD	CAD/PDM	CAD sends PDM file and referenced CAD files	Consistency between meta data in PDM and CAD files
4a	CAD	CAD/PDM	CAD sends integrated file; PDM manages single part	Correct meta data for managing the complete CAD model
5	CAD/PDM	CAD	CAD/PDM sends package of PDM and CAD files	CAD has to store relevant meta data persistently
5a	PDM	CAD	PDM only sends „CAx meta data template“	CAD has to create a new CAD model (incl. Case 5)

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# PDM-IF Scope of the Test Campaigns 2000

- 3rd PDM Test Campaign
  - document properties
  - engineering change and work management incl. project and contract
  - effectivity and configuration
- common Test Campaign PDM - CAD (4th)
  - geometric model support by PDM processors
  - product structure with external geometric reference by CAD processors
  - geometrical relationships also with transformation
  - shape aspect support
  - concepts for alias data handling
- 5th PDM Test Campaign
  - additional part properties (e.g. material, general)
  - several item structure relationships (e.g. make\_from, alternate, substitute)
  - security classification
  - robust testing

# PDM-IF Schedule for PDM-IF

- **March 29/30 - PDM-IF, USA**
  - Analysis of Test Campaign 3
  - Definition of Test Campaign 4
- **May 5 - Complete test suite available**
- **June 18 - Pre-processing complete**
- **July 9 - Post-processing complete**
- **July 26/27 - PDM-IF, Germany**
  - Analysis of Test Campaign 4
  - Definition of Test Campaign 5
- **August 27 - Complete test suite available**
- **October 1 - Pre-processing complete**
- **October 29 - Post-processing complete**
- **November 16/17 - PDM IF, Germany**